**T08D04 - Brønsted-Lowry v Arrhenius Acids & Conjugates**

Name ……………..…………………………

1. Write an equation showing HCl acting as a Brønsted acid.

Write an equation showing NH3 (ammonia) acting as a Brønsted base.

Why is HCl considered an Arrhenius acid but ammonia not considered an Arrhenius base?

2. Why do both theories (Arrhenius and Brønsted) consider NaOH to be a base?

Why does the Brønsted theory consider the carbonate ion, CO3 2- , to be a base, while the Arrhenius theory does not?

3. What is a conjugate acid-base pair?

4. In the following equations label the Reactants as Brønsted conjugate acid/base pairs:

NH+ (aq) + OH - (aq) ⮀ NH3 (aq) + H2O (l)

C2H3O2 - (aq) + H3O + ⮀ HC2H3O2 (aq) + H2O (l)

5. Write the **formula AND give the name** of the conjugate base of each of the following acids:

a. HCN b. HNO2 c. HSO4-

6. Write the **formula AND give the name** of the conjugate acid of each of the following bases:

a. NH3 b. HS- c. Br-

7. Select (label) the conjugate acid-base pairs in each of the following equations:

a. HC2H3O2 (aq) + H2O (l) ⮀ H3O + (aq) + C2H3O2 - (aq)

b. NH4 + (aq) + OH - (aq) ⮀ NH3 (aq) + H2O (l)

c. Cl - + H3O + (aq) ⮀ HCl + H2O (l)

d. HCN (aq) + H2O (l) ⮀ CN - (aq) + H3O + (aq)

Several acids are listed below with their respective equilibrium constants.

8. HF (aq) + H2O (l) ⮀ H3O + (aq) + F- (aq) Ka = 7.2 x 10-4

HS- (aq) + H2O (l) ⮀ H3O + (aq) + S 2- (aq) Ka = 1.3 x 10-13

CH3COOH (aq) + H2O (l) ⮀ H3O + (aq) + CH3COO- (aq) Ka = 1.8 x 10-5

a. Which is the strongest acid? ...................

b. Which is the weakest acid? .....................

c. Which acid has the **weakest** conjugate base? .............................

d. Which acid has the **strongest** conjugate base? ...........................

9. HOBr (aq) + H2O (l) ⮀ H3O + (aq) + OBr- (aq) Ka = 2 x 10-9

HC2H2ClO2- (aq) + H2O (l) ⮀ H3O + (aq) + C2H2ClO2- (aq) Ka = 1.35 x 10-3

HC7H5O2 (aq) + H2O (l) ⮀ H3O + (aq) + C7H5O2- (aq) Ka = 6.4 x 10-5

a. Which is the strongest acid? ...................

b. Which is the weakest acid? .....................

c. What is the conjugate base of H3O+?……………………….

d. Which acid has the **weakest** conjugate base? .............................

e. Which acid has the **strongest** conjugate base? ...........................